

WHAT IS CLAIMED IS:

1. Apparatus for associating information with a biological reagent, the apparatus comprising:

a carrier for supporting the biological reagent; and

at least one RFID tag comprising a carrier RFID antenna coupled to the carrier, wherein the RFID tag is operable to be read by an RFID reader and wherein the RFID tag comprises identification information for the biological reagent.
2. The apparatus of claim 1, wherein the carrier comprises a microarray.
3. The apparatus of claim 1, wherein the carrier comprises a surface plasmon resonance array.
4. The apparatus of claim 1, wherein the carrier comprises a reaction plate.
5. The apparatus of claim 1, wherein the carrier comprises a tube.
6. The apparatus of claim 1, wherein the carrier comprises a tube carrier for holding a plurality of tubes.
7. The apparatus of claim 1, wherein the carrier comprises a microfluidic card.

8. The apparatus of claim 1, wherein the carrier RFID antenna is embedded in an interior portion of the carrier during a carrier manufacturing process.

9. The apparatus of claim 1, wherein the carrier RFID antenna is adhesively applied to at least part of an exterior portion of the carrier.

10. The apparatus of claim 1, further comprising:
at least one instrument having an instrument RFID reader for reading the identification information; and
at least one output interface that provides output information regarding an identification of the biological reagent while the instrument is performing operations in connection with the biological reagent.

11. The apparatus of claim 10, wherein the instrument comprises a non-transparent enclosure that substantially prevents optical scanning of a barcode on an object positioned within the instrument.

12. Apparatus for associating information with a biological reagent, the apparatus comprising:
a carrier for supporting the biological reagent; and
at least one RFID tag comprising a carrier RFID antenna coupled to the

carrier, wherein the RFID tag is operable to be read by an RFID reader and wherein the RFID tag comprises supplemental information.

13. The apparatus of claim 12, wherein the biological reagent comprises a nucleic acid and the supplemental information comprises information regarding a sequence of the nucleic acid.

14. The apparatus of claim 12, wherein the supplemental information comprises information regarding past experiments performed with the biological reagent.

15. Apparatus for associating information with a biological reagent, the apparatus comprising:

a carrier for supporting the biological reagent; and

at least one RFID tag comprising a carrier RFID antenna coupled to the carrier, wherein the RFID tag is operable to be read by an RFID reader and wherein the RFID tag contains rights information.

16. The apparatus of claim 15, wherein the rights information comprises information regarding a license for use of the biological reagent.

17. The apparatus of claim 15, wherein the rights information is adapted to be read by a biological instrument for reagent processing, the biological instrument comprising a reader for the RFID tag.

18. The apparatus of claim 16, wherein the rights information further comprises information regarding a number of times the biological reagent can be used in connection with a particular assay.

19. The apparatus of claim 15, wherein the rights information comprises information regarding whether the biological reagent has been subject to a recall.

20. Apparatus for associating information with a microarray, the apparatus comprising:

a substrate;

the microarray; and

an RFID tag having an RFID antenna coupled to the substrate.

21. The apparatus of claim 20, wherein the RFID tag comprises nucleic acid sequence information and location information for at least one unique oligonucleotide spot in the microarray.

22. The apparatus of claim 20, wherein the RFID tag comprises pattern information for at least one spot pattern associated with at least one assay for the microarray.

23. The apparatus of claim 20, wherein the substrate comprises a first surface and a second surface, wherein the first and second surfaces face in opposing directions, and wherein a chamber is positioned upon the first surface of the substrate.

24. The apparatus of claim 23, wherein at least a portion of the RFID antenna is affixed to the second surface face of the substrate.

25. The apparatus of claim 23, wherein at least a portion of the RFID antenna is located between the first and second surfaces of the substrate.

26. The apparatus of claim 23, wherein the RFID antenna is positioned substantially along a periphery of the substrate.

27. The apparatus of claim 23, wherein the RFID antenna is affixed to at least a portion of a margin inside a periphery of the substrate.

28. Apparatus for associating information with a biological reagent, the apparatus comprising:

a carrier for the biological reagent, the carrier coupled to an RFID tag, wherein the RFID tag is operable to be read by an RFID reader and wherein the RFID tag contains identification information; and

at least one instrument for reading the identification information, and performing operations on the biological reagent, the instrument comprising an output for providing an identity indication of the biological reagent based on the identification information, wherein the instrument is generally opaque, thereby blocking optical paths to contents of the instrument.

29. Apparatus for associating information with a biological reagent, the apparatus comprising:

a carrier for supporting the biological reagent; and

at least one RFID tag comprising a carrier RFID antenna coupled to the carrier, wherein the RFID tag is operable to be read by an RFID reader and wherein the RFID tag comprises instrument operation information for the biological reagent.

30. The apparatus of claim 29 further comprising a biological instrument controller coupled to a biological instrument, the biological instrument coupled to the RFID reader, wherein the biological instrument comprises:

instrument hardware, instrument firmware, and instrument data collection software.

31. The apparatus of claim 30, wherein the biological instrument controller comprises a general purpose computer, the general purpose computer coupled to the biological instrument via a data network connection that is operable to carry the instrument operation information between the general purpose computer and the biological instrument.

32. The apparatus of claim 30, wherein the instrument operation information comprises parameters for defining operation of the instrument data collection software.

33. The apparatus of claim 30, wherein the instrument operation information comprises parameters for defining operation of the instrument firmware.

34. The apparatus of claim 29, wherein the instrument operation information comprises ASCII encoded, human readable module information that defines the behavior of the biological instrument.

35. The apparatus of claim 29, wherein the instrument operation information comprises ASCII encoded, human readable method information that defines the behavior of the biological instrument.

36. The apparatus of claim 29, wherein the instrument operation information comprises instructions for the operation of a sample pump coupled to the biological instrument.

37. The apparatus of claim 29, wherein the instrument operation information comprises instructions for control of a mechanical robot for physically manipulating the biological reagent coupled to the biological instrument.

38. The apparatus of claim 29, further comprising a biological instrument controller coupled to a biological instrument, the biological instrument coupled to the RFID reader, wherein the biological instrument receives the instrument operation information and, based on the instrument operation information, performs at least one instrument operation.

39. A method for associating information regarding biological reagents with carriers for supporting the biological reagents, the method comprising:

providing a carrier for at least one biological reagent, the carrier coupled to an RFID tag, wherein the RFID tag is operable to be read by an RFID reader; and

receiving, from the RFID tag, identification information associated with the biological reagent.

40. The method of claim 39 further comprising:
tracking the biological reagent as the biological reagent undergoes a reagent manufacturing process.

41. The method of claim 39 further comprising:
obtaining real-time physical location coordinates associated with the biological reagent.

42. The method of claim 41, wherein obtaining the real-time physical location coordinates comprises receiving RFID triangulation parameters from a plurality of triangulation RFID readers proximate to the RFID tag.

43. The method of claim 41, wherein obtaining the real-time physical location coordinates comprises receiving GPS coordinates from a GPS receiver physically coupled to the carrier.

44. The method of claim 39 further comprising:
maintaining a threshold inventory quantity of units of the biological reagent based on a count of the carriers established by reading the RFID tag associated with the units.

45. A method for associating information regarding biological reagents with carriers for supporting the biological reagents, the method comprising:

providing a carrier for a biological reagent, the carrier coupled to an RFID tag, wherein the RFID tag is operable to be read by an RFID reader; and

receiving, from the RFID tag, supplemental information associated with the biological reagent.

46. The method of claim 45 further comprising:

storing in the RFID tag, as a portion of the supplemental information, composition information regarding a composition of the biological reagent.

47. The method of claim 46, wherein the composition information comprises nucleic acid sequence information.

48. The method of claim 46, wherein the composition information comprises annotated reagent information regarding past experiments performed with the biological reagent.

49. The method of claim 45 further comprising:

following the biological reagent while the biological reagent is utilized in a biological assay.

50. The method of claim 45 further comprising:

storing traveler information regarding the biological reagent while the biological reagent is utilized in a biological assay.

51. The method of claim 45 further comprising:
reading genealogy information regarding the biological reagent while the biological reagent is utilized in a biological assay.

52. The method of claim 45, wherein the supplemental information comprises material safety data sheet (MSDS) information.

53. The method of claim 45, wherein the supplemental information comprises work order number information.

54. The method of claim 45, wherein the supplemental information comprises customer identifier information.

55. The method of claim 45, wherein the supplemental information comprises customs service information.

56. The method of claim 55, wherein the customs service information comprises country of origin information.

57. The method of claim 45, wherein the supplemental information comprises lot number information.

58. The method of claim 45, wherein the supplemental information comprises batch number information.

59. A method for associating information regarding biological reagents with carriers for supporting the biological reagents, the method comprising:

providing a carrier for a biological reagent, the carrier coupled to an RFID tag, wherein the RFID tag is operable to be read by an RFID reader; and

receiving, from the RFID tag, rights information associated with the biological reagent.

60. The method of claim 59 further comprising:

authorizing under terms of a license, use of the biological reagent in a biological assay.

61. The method of claim 59 further comprising:

receiving license identifier information from the RFID tag;

authenticating the license identifier information; and

based on the authenticated license identifier information, permitting the performance of at least one licensed activity in connection with the biological reagent.

62. The method of claim 61, wherein the at least one licensed activity comprises a biological assay performed on a separately licensed instrument.

63. The method of claim 61, wherein the license identifier information comprises a digital signature.

64. The method of claim 59 further comprising:
validating integrity of the biological reagent for use in connection with a specific biological assay.

65. The method of claim 64, wherein validating of the integrity of the biological reagent comprises:
employing at least a portion of the rights information in a recall-list lookup operation to determine whether the biological reagent has been subject to a recall.

66. A method for associating information regarding operations for biological reagents with carriers for supporting the biological reagents, the method comprising:

providing a carrier for at least one biological reagent, the carrier coupled to an RFID tag, wherein the RFID tag is operable to be read by an RFID reader; and
receiving, from the RFID tag, instrument operation information associated with the biological reagent.

67. The method of claim 66, wherein the instrument operation information comprises parameters for controlling software on a biological instrument coupled to the carrier.

68. The method of claim 66, wherein the instrument operation information comprises at least one sequence of operations to be performed on a biological instrument coupled to the carrier.

69. The method of claim 66, wherein the instrument operation information comprises at least one set of conditions for changing states within a software-implemented state machine in a biological instrument coupled to the carrier.